Media selection in IT offshore teams: findings from an industry survey

Wykowski, S ; King, G ; Wende, Erik ; Philip, Tom

Abstract: This exploratory study captures media selection practices in offshore outsourced teams. The findings are based on a survey of 114 respondents, 72 of whom have directly participated in global virtual teams.Local resource constraints and the need to be cost-effective have driven many companies tosend various business functions offshore. Several studies have reported on failed offshore outsourcing projects that annually end up costing participant organizations billions of dollars. Why do such projects fail? Among the most common reasons are the communication challenges inherent to offshoreprojects. Members of a global team face many well-documented challenges (language barriers,cultural differences, organizational differences) and choice of media in particular has an impact on team performance.The significance of media selection was particularly evident in our research in relation to conflicts within teams, which were largely attributable to less rich, low-synchronous media. A further key finding that the research identifies is a high success rate of global virtual teams and a correlationbetween use of instant messaging and team success, with instant messaging users being significantly more likely to report a very effective team and very high team satisfaction. Furthermore the researchindicates no correlation between face-to-face meetings, more effective teamwork and higher team satisfaction. This was an unexpected result, as it is contrary to the common understanding. The last section of the paper proposes avenues for further research.

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(completed research paper)

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The significance of media selection was particularly evident in our research in relation to conflicts within teams, which were largely attributable to less rich, low-synchronous media. A further key finding that the research identifies is a high success rate of global virtual teams and a correlation between use of instant messaging and team success, with instant messaging users being significantly more likely to report a very effective team and very high team satisfaction. Furthermore the research indicates no correlation between face-to-face meetings, more effective teamwork and higher team satisfaction. This was an unexpected result, as it is contrary to the common understanding. The last section of the paper proposes avenues for further research.

Keywords: survey, offshore, outsourcing, software, communication, media selection

1 INTRODUCTION AND BACKGROUND

Local resource constraints and the need to be cost effective have driven many companies to send various business functions offshore. Offshore sourcing takes several forms, including: captive sourcing, in which companies develop remote premises in lower cost countries; satellite teams or virtual teams, which are comprised of team members which are all remotely located and interact only by communications media, and; offshore outsourcing, in which companies send tasks or whole business functions to a remote partner organization.

This paper focuses only on the phenomenon of offshore outsourcing, with a particular focus on the software industry. Offshore outsourcing is distinct from the other global sourcing models in several respects. It involves the combination of two separate companies, making it distinct from captive sourcing in which both or all parts of the enterprise are part of, and wholly owned by, the same organization, and subject to the same company practices and rules. In contrast, offshore outsourcing comprises two or more ‘sides’, which are independent of each other and thus subject to differing organizational structures and norms.

Offshore outsourcing involves the formation of a type of virtual team (Sakthivel, 2005), but it is distinct from the satellite team phenomenon since parts of the team are collocated. In the field of software development, the offshore outsourcing model typically involves a team of client software developers and a remote team of software developers, which work in a coordinated manner. In this respect, we assert that offshore outsourced teams can be understood as 'partial virtual teams' or 'split teams', which work together towards common goals.

Offshore outsourcing in the information technology (IT) field has become an accepted strategy for many companies across the world. For the past ten years, it has become increasingly common for IT projects to be sent to geographically and culturally distant countries that offer lower production costs or greater availability of resources (Willcocks and Lacity, 2006, Carmel and Tija, 2005).

In common with other types of virtual teams, communication and coordination are very important for the success of offshore outsourced teams. The importance of effective communication has been well documented and number of authors (Niinimäki et al., 2010) name communication the most important success factor for software projects.

While effective communication and coordination is recognized as being of critical importance, it is also recognized that offshore outsourced teams (in common with other remote teams) face a number of communication and coordination challenges. While communication is difficult even in collocated settings, it becomes even more problematic in offshore projects, where teams work in separate locations (Carmel and Tija, 2005). Working in different time zones, dealing with language difficulties, cultural differences and the inability to interact face-to-face are all commonly cited as challenges faced by remote teams (Heeks et al.). Remote co-workers can experience difficulties in relationship building, resulting from cultural differences and communication issues (e. g., differences in language and lack of nonverbal cues). Research shows that the development of personal relationships among virtual team members is an important factor in effective working relationships and that team relationships are built more slowly using information and communications technology (ICT) based communication (Robert et al., 2009).

In addition to these challenges, offshore outsourced teams face some challenges that are distinct from the other offshore models. Given that offshore outsourced teams are composed of two or more separate companies, differing governance structures, organizational practices, rules and norms can result in communication and coordination difficulties.

Offshore outsourced teams rely on communications media to coordinate and use a variety of communication tools, including the telephone, videoconferences, email and instant messaging. Given that these modes of communication are used as substitutes for face-to-face interaction and each have different characteristics and properties, the ongoing selection of communication medium channels (media selection) is of crucial importance for effective task performance in offshore outsourced teams (Staples and Jarvenpaa, 2000).

Nevertheless, a review of the current literature finds no relevant data on media selection in offshore outsourced teams. Generally the available data covers media selection in other global sourcing models.

This leads us to our research question: What communications media are currently in use in offshore outsourced teams? We designed an exploratory survey to attempt to source real data from firms engaged in offshore outsourcing. We did not try to establish or explain any theory. Rather, we set out to simply investigate and report on the current situation. It is intended that the results will form a basis for generating propositions and avenues for further research.

2 RELATED THEORY

Many of the studies in this field explain media selection by using Daft and Lengel's media richness theory (MRT) (Daft and Lengel, 1986), which explains how the richness of information conveyed through the media helps people to engage in communication activities, thereby reducing the uncertainty and ambiguity associated with their assigned tasks. For instance, Pauleen and Yoong discuss the importance of information and communication technologies for relationship building in virtual teams. They utilize the MRT to explain that some media channels may encourage informal communication and relationship building (Pauleen and Yoong, 2001).

McGrath also affirms—in his Time, Interaction, and Performance (TIP) theory—that relationship development is important for effective work groups and that communication media could have both positive and negative effects on a group's production, well-being and member support functions. This issue is even more important for virtual teams because they are completely dependent on communication media (Mcgrath, 1991).

Regarding the importance of communication processes and group relationships, the Media Synchronicity Theory (MST) developed by Dennis et al. argues that, in general, communication consists of information transmission and information processing. The capabilities of the medium will influence the use or misuse of the medium and, in the end, will have a direct effect on communication performance (Dennis et al., 2008). Researchers note that one medium is not "better" than another; in fact, most tasks are composed of a series of communication processes that require different media capabilities over time.

Furthermore, Dennis et al. define *media synchronicity* as "the extent to which the capabilities of a communication medium enable individuals to achieve synchronicity" (Dennis et al., 2008 p. 581). Dennis et al. also contend that certain media capabilities influence the way that individuals transmit and process information and the degree to which they work (i.e., their level of synchronicity). Thus, there is a connection between communication process and media capability, and that connection facilitates better knowledge acquisition and leads to better outcomes. It is not solely the medium or its capabilities that directly influence communication performance, but also the way in which the medium is used (Dennis et al., 2008). Dennis et al. also argue that as familiarity with the task increases, the need for synchronicity is reduced.

So this brings us to our research question and it is interesting to explore which media are used in situations where people are dependent on media-based communication and where there are no clear corporate policies relating to the use of media. A follow-up question is whether the teams are successful with the media-mix or not.

3 SURVEY DESCRIPTION

This paper is based on data gathered through an industry survey, undertaken as part of a diploma thesis at the University of Applied Sciences in Mittweida, Germany. The focus of the survey was to analyze the interrelation of team composition, media choice and relationship quality in culturally diverse virtual teams.

A key challenge was sourcing a sufficient number of survey respondents from within the target group. This was done by initially focusing on participants in the world's largest trade fair for digital IT and telecommunications solutions—the CeBIT. Many of these participants specialized in Offshore Software Development. Secondly, we undertook an online search to obtain a list of the 100 global outsourcing leaders. Finally, the survey link was published on social networking sites, including xing.de and linkedin.com, especially in forums about offshore and outsourcing projects.

They survey, which ran from December 2010 to January 2011, was conducted through an online survey service (Survey Monkey) and was made available in both English and German language. A total of 920 participants from across the world were sent the survey directly, yielding 68 individual responses from about 60 firms (at a response rate of 7.4%). A further 46 responses were gained as a result of the survey's presence on networking sites, giving us a total of 114 respondents, all of whom had had direct experience working in offshore outsourced teams. Given that all survey respondents entered information about their role and status, we did not differentiate between participants from the mailings and those from the social network sites in our analysis of the data.

The survey initially asked the participants, "Was the last team you worked in an international one?" The results found that 72 participants (from about 42 firms) answered "yes". Furthermore, 90% of these participants stated that communication in the team took place over different time zones. Of the 72 participants stating that their last team was an international one, 22 were German-speaking and 50 participants were English-speaking. As regards the role of respondents within their respective teams, we found that 15% were clients of a service and 85% were vendors of a service. Furthermore, 15% were operative workers and 85% administrative (i.e., manager level) workers.

The survey, which comprised 53 questions in total, included general questions about the nature of the respondent's virtual team experiences, as well as more targeted questions aimed at investigating key aspects of the operation of global virtual teams as identified in the literature. The data were then analyzed with IBM SPSS Statistics software to hone in on our research question. If the reader is interested in viewing the full survey questions and data, please contact one of the authors.

4 ANALYSIS AND DISCUSSION

Concerning media selection by offshore outsourced teams, our survey found that most of our participants used common media like email (93%) and telephone (80%). Instant messaging represented the third most frequently used media (66%) and voice-chat, text-chat and videoconferences also play important roles for members of offshore outsourced teams. The figure 1 shows the media selection of our respondents.

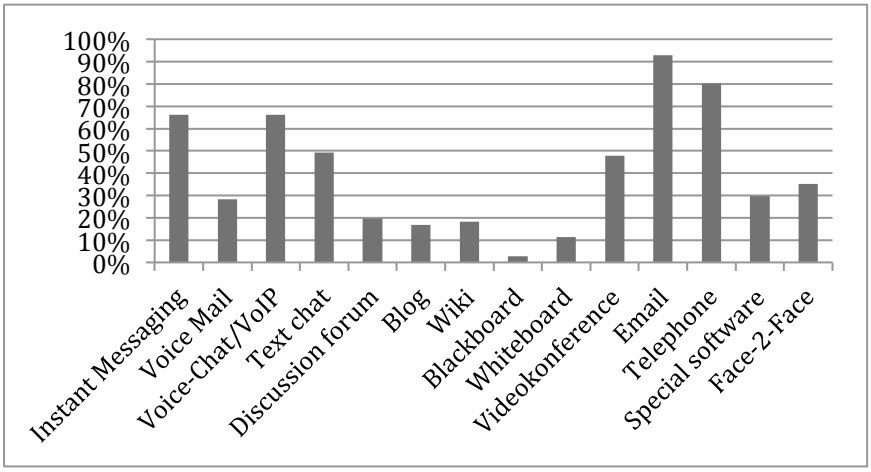

Figure 1 – Media selection (N= 401)

Media selection depends on a lot of factors (as discussed in Section 2 of this paper). In our study, 42% of participants chose their media for its safety features over its user friendliness, and 21% changed the choice of media during their last project. Additionally, 61% of our respondents were able to change media, while 21% desired a change of media.

The survey indicated that the age of those within the team is also an influence on media choice. The most notable and relevant difference is in relation to use of IM, where the survey found that IM is used most heavily and valued most highly by younger team members, with 69% of respondents under 45 years of age saying that they use IM, whereas only 53% of those over 45 use it.

Although the survey found that instant messaging was less commonly used by older team members, it nevertheless found that IM is very widely used in global virtual teams. Two-thirds (66%) of survey respondents reported IM being used in their most recent team experience, making it the most widely used medium for global virtual teams after email and telephone. This is in line with other research showing that instant messaging is becoming mainstream in business contexts (Herbsleb and Mockus, 2003, Herbsleb et al., 2001, Nardi et al., 2000) and especially so in OOSD projects (Wende and Philip, 2011).

For a small proportion of survey respondents, the familiar outsourcing challenges (language barriers, cultural differences and differing organizational practices) clearly created a difficult work environment. When asked to specify through an open question what differences they notice between working in intercultural virtual teams and working in other teams, 23 respondents (20%) described specific problems. The majority (twelve) of these respondents described problems associated with language, communication, interpretation and information. Seven reported difficulties relating to work effort, quality and adherence to deadlines. This, we believe, is indicative of the inherent challenge faced by offshore teams in creating and maintaining a productive group dynamic where members are engaged and committed.

Conflict situations were very commonly reported by survey respondents, with 58% saying that a conflict or conflicts occurred in their most recent virtual team experience. Typically, conflicts were associated with non-synchronous media, with 61% of respondents who answered the question identifying email as the medium where conflict occurred or arose. The survey results then show evidence of teams switching to richer more synchronous media for conflict resolution, with 87% reporting that conflicts were resolved through face-to-face meetings, video conference, telephone or a combination of these. This seems to support the MST, which states that less synchronous media can be detrimental to task performance due to the greater tendency for uncertainty and ambiguity in information exchange.

The majority of survey participants (85%) stated that they depend on information and knowledge transfer from other team members to be able to fulfil their work. As regards which media were used to transfer this knowledge, 96% of respondents indicated email and 64% indicated telephone. When asked to specify through an open question which problems they encountered in this knowledge transfer process, 6 respondents described specific problems. Two respondents described problems with obtaining the correct and up to date information, and 4 participants had communication problems, for example:

- *"Some difficulties finding the information I need."*
- *"Language & interpretation."*

We concluded that most of the problems were the result of communication barriers and that therefore media selection must play an important role for offshore outsourced teams. Team members must modify their media selection when participating in offshore outsourced projects, to avoid communication and information problems.

A finding from the survey was that offshore outsourced teams are largely successful. When asked to rate the effectiveness of their most recent virtual team experience, 83% said that their most recent virtual team was either 'effective' or 'very effective'. In addition, 93% of respondents described team satisfaction as either 'strong' or 'very strong'. This reflects the fact that for many firms, offshore outsourcing and the management of virtual teams is now an established practice. This is particularly true in the field of software development. Indeed, the majority of respondents (90%) reported that they work in virtual teams either 'regularly' or 'always'.

Nevertheless, the 17% of respondents that rate their most recent virtual team experience as 'ineffective' or 'very ineffective' is not an insignificant proportion. It is evident that offshore outsourcing carries risks. Comparing our findings to previous research, a 2001 study of 70 global business teams found that only 18% considered their performance 'highly successful,' and the remaining 82% fell short of their intended goals, with one third rating their experience as largely unsuccessful (Govindarajan and Gupta, 2001). As noted, by its nature, offshore outsourcing frequently brings together project partners from different cultures, and as such, the governance structures, organizational rules and project management styles of project partners can differ widely and thus potentially affect the project significantly (Wende and Philip, 2011). Along with language difficulties, cultural distribution and collaboration structure are known to be risk factors that may hinder the success of virtual teams (Persson et al., 2009). These factors can exacerbate challenges associated with communication, coordination and collaboration between vendors and clients, as well as affect various levels of offshore outsourced software development (Wende and Philip, 2011).

Interestingly, the survey data suggests that offshore outsourced teams which use IM are more likely to experience a very successful team environment. The majority of survey respondents (59%) who reported that IM was used in their most recent virtual team say that the team was 'very effective.' Less than a quarter (23%) of IM non-users said the same. Additionally, IM users are more likely to report very high team satisfaction than non-users, with 34% of IM users saying that team satisfaction was 'very positive,' whereas 25% of non-users said the same.

The table 1 shows a comparison between IM users and non-users regarding their ratings of the effectiveness of their teams.

	Very ineffective	Ineffective	Effective	Very effective
IM Non-Users	0%	23.1%	53.8%	23.1%
IM Users	2.9%	11.8%	26.5%	58.8%

Table 1 – IM (N1=34), IM Non-Users (N2=13) and effective teamwork

We believe that this is a key finding of the research, and later in the paper we discuss the strengths of IM for global virtual teams as reasons for the observed correlation between IM usage and team success.

The survey results found that some of the participants occasionally had the opportunity to meet remote team members face-to-face, whereas others interacted solely via communications media throughout the project. A comparison of these two groups surprisingly indicates no correlation between the potential for face-to-face meetings and more effective teamwork. The table 2 presents the data.

	Very ineffective	Ineffective	Effective	Very effective
No Face-to-Face meetings	3.3%	16.7%	36.7%	43.3%
Face-to-Face meetings	0.0%	11.8%	29.4%	58.8%

Table 2 – Face-to-Face (N1=17), No Face-to-Face (N2=30) meetings and effective teamwork

The statistical analysis (chi-square-test) shows that groups with no face-to-face interaction could also work effectively. This result is contrary to the common understanding, which is evident in the literature, that people using communication media are likely to be less productive compared with people working in a face-to-face environment and that frequent face-to-face interactions are a key to success in virtual work (Sakthivel, 2005). Additionally, the lack of face-to-face meetings does not influence team satisfaction negatively. Table 3 shows the comparison between face-to-face meetings and no face-to-face meetings regarding their ratings of the effectiveness of their teams.

	Very low	Low	High	Very high
No Face-to-Face meetings	0.0%	5.6%	61.1%	33.3%
Face-to-Face meetings	0.0%	0.0%	63.2%	26.3%

Table 3 – Face-to-Face (N1=17), No Face-to-Face meetings (N2=36) and effective teamwork

We believe this suggests that face-to-face meetings are no longer necessary for teams to be successful. This may be indicative of the fact that offshore outsourcing projects are an increasingly accepted strategy for IT firms and that nowadays the majority of people have had experience of virtual teamwork and are aware of the challenges. We believe, that the key future challenge for offshore outsourced teams is to find the right media mix so that team members of can work optimally.

The survey asked all respondents the open question, "In your experience, how has the nature of virtual teamwork changed?" Of 25 respondents who described changes, most of the respondents (40%) described changes relating to communication, for example:

- *"Today, the Internet is more stable and the applications are more advanced than some years ago. This has resulted in different applications, including social networks, and a better*

understanding of the needs of the different team members. This leads to more effective and efficient teamwork."

- *"We have learned how to use a media mix ideal and how often we should communicate."(translated)*
- *"Our expectations of effective team work have grown. We need more communication; [communication effort] raise from 20 to 40%." (translated)*
- *"We now use Skype, which is very helpful."*

The functionality of IM, provides clear strengths for offshore outsourced software development projects. Its being predominantly text-based is well-suited to software development, as it allows developers to exchange textual information such as code snippets and links. The medium's capacity for real-time communication allows developers to ask questions, share information and problem-solve in the midst of the process. For dispersed teams, this offers an obvious advantage over email and other text-based communication channels.

In addition, we believe that the characteristics of IM are conducive to alleviating or resolving some of the key difficulties faced by global virtual teams, including those described earlier in the paper: language problems, incidence of conflict and team cohesion.

Although the most widely used function of IM (text-based dialogue) is less rich than communication incorporating video or audio, the real-time interaction makes it more engaging and personal than email. As such, it is more conducive to informal communication and aiding the development of relationships among team members. Our survey results support this, with almost all IM users (97%) indicating that they use communications media for small talk as well as business-related communication on a regular basis. Only 62% of IM non-users say that they engage in small talk. Furthermore, 60% of chat program users also utilized status notifications. Symbols of online or availability status enable members of a virtual team to create a better coherent impression (Kahai et al., 2007). Additionally, the survey found that IM users report a higher level of team satisfaction in general than non IM users.

Other research has shown that when IM is used freely among developers in software development projects, it encourages informal chat among team members and can facilitate development of a subculture within the project organization (Wende and Philip, 2011). The direct link between team members as facilitated by IM, including through features such as online or availability status markers, can create a sense of connection and group well-being.

The survey found that respondents who rate IM most highly are less likely to report incidence of conflicts within the team. Fully 56% of IM users report a conflict in their most recent team experience, whereas three-quarters (75%) of IM non-users report a conflict. While the causes of conflicts are various, it is likely that the higher level of synchronicity (relative to email) offered by IM tends to reduce conflict situations borne from misinterpretation of messages between team members, given that these kinds of misunderstandings are more likely to be identified and dealt with early. (As noted above, the survey found that conflicts typically arise in non-synchronous media.)

If IM is used as a key communications medium in software development projects, it can facilitate transparent knowledge flow between those team members most directly engaged in delivery of the work, without the need to get information from the managers, thus bridging hierarchies in communication, which are known to hinder the flow of information and thus the productivity of a team (Wende and Philip, 2011).

5 CONCLUSIONS

Through this research study, we aimed to contribute to the field by capturing current media selection practices in offshore teams through an industry survey of IT offshore outsourced teams. Whilst the research focuses on offshore outsourcing, particularly in the field of software development, we believe the research findings are also applicable to other sectors. However, our research has some limitations. We asked our respondents to rate their last virtual teamwork concerning to effective teamwork and team satisfaction. However, it could be possible that people tend to report positive projects.

One part of the motivation for our research was to set out a report on the current situation, which should form a basis for generating propositions and further research. Due to the relatively small number of participants in this study, further and more in-depth research would be valuable to test the robustness of our findings and contribute to further understanding of the offshore outsourcing field.

We found that survey respondents faced many well-documented challenges associated with offshore teams, in particular information and communication problems.

Nevertheless, one finding did not confirm the common understanding: We found no correlation between face-to-face meetings, more effective teamwork and higher team satisfaction. We believe this indicates that with an ideal media mix face-to-face meetings are no longer essential for effective teamwork or for higher team satisfaction, but further research is necessary to prove this conclusion.

Furthermore, we proved that media choice is very important for team effectiveness. This was particularly evident in relation to conflicts and information sharing within teams, which were largely attributable to less rich, low-synchronous media.

Interestingly, we found that the key aspect of our research (media choice) is the most frequently changed aspect, given experience with earlier virtual team projects. Furthermore, offshore team members tend to shift from old media to newer media like instant messaging (IM).

Our research confirmed that IM is now an indispensible medium for many teams in offshore outsourced software development, with two-thirds of respondents reporting that it is used in their teams. Another new finding that we believe our research identifies is the correlation between IM and team success, with IM users being significantly more likely to report a very effective team and very high team satisfaction. Further research is needed to confirm that this correlation is robust and to fully investigate the causes. Nevertheless, we believe other findings in our study and in associated research indicate likely reasons for this correlation. The survey further found that IM users are more likely to use online or availability status notifications and engage in small talk, indicating that the medium is well suited to dealing with two of the key challenges of offshore teams: relationship building and communication problems. The fact that IM users are less likely to report conflicts suggests that problems associated with the misinterpretation of messages (the cause of many conflicts) is less of a problem with IM.

Our research has found that media choice is an important factor for the success of offshore teams. As such, project managers must take media selection seriously to enhance the operation of offshore outsourced teams, given that the choice of media offers different capabilities in terms of synchronicity and richness. We believe that further research should investigate methods for guiding communication and media selection. Furthermore, we believe that the inability to interact face-to-face is no longer a disadvantage of offshore teams. But further research is necessary to examine this point.

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